

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the subject application. The Office Action of March 17, 2004 has been received and contents carefully reviewed.

By this Amendment, Applicant amends claims 1 and 12 and cancels claim 4 without prejudice or disclaimer. In addition, Applicant adds new claim 21. Accordingly, claims 1-3, 5-8, 10-14, 17-19 and 21 are currently pending in the present application. Reexamination and reconsideration of the application are respectfully requested.

In the Office Action, the Examiner rejected claims 12-14 and 17-19 under 35 U.S.C. § 112 ¶2; rejected claims 1-2, 4-5, 7-8, 10-13 and 18-19 under 35 U.S.C. § 102(b) as being anticipated by Moren et al. (U.S. Patent No. 6,142,304); rejected claims 3 and 14 as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Moren et al.; rejected claims 1, 4, 5, 7-8, 10 under 35 U.S.C. § 102(b) as being anticipated by Redden et al. (U.S. Patent No. 6,345,720); rejected claims 6 and 17 under 35 U.S.C. § 103(a) as being unpatenable over Moren et al. Applicant respectfully traverses these rejections.

With respect to the rejection of claims 12-14 and 17-19 under 35 U.S.C. § 112 ¶2, Applicant respectfully submits that in view of the amendments, the rejection is now believed to moot. Accordingly, Applicant respectfully submits that claims 12-14 and 17-19 are in full compliance with 35 U.S.C. § 112 ¶2.

The rejection of claims 1-2, 4-5, 7-8, 10-13 and 18-19 under 35 U.S.C. § 102(b) as being anticipated by Moren et al., the rejection of claims 3 and 14 as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Moren et al., the rejection of claims 6 and 17 under 35 U.S.C. § 103(a) as being unpatenable over Moren et al. are respectfully traversed and reconsideration is requested. Claim 1 is allowable over the cited references in that claim 1 recites a combination of elements including, for example, "an upper plate extending from an upper side of said first side wall and having a groove, the groove for retaining the lamp wire..." None of the cited references, singly or in combination, teaches or suggests at least this feature of the claimed invention. Accordingly, Applicant respectfully submits that claim 1 and claims 2, 3, 5-8 and 10-11, which depend therefrom, are allowable over the cited references.

Applicant respectfully submits that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. See M.P.E.P. § 2131. Applicant further respectfully submits that to establish a prima facie case of obviousness under 35 U.S.C. § 103, the prior art references when combined must at least teach or suggest all the claim elements. Since Moren et al. fails to teach the aforementioned feature, claim 1 is allowable.

Claim 12 is allowable over the cited references in that claim 12 recites a combination of elements including, for example, "an upper plate extending from an upper edge of the first side wall to an upper edge of the second side wall; a plurality of grooves at the upper plate, the grooves retaining the lamp wires..." None of the cited references, singly or in combination, teaches or suggests at least this feature of the claimed invention. Accordingly, Applicant respectfully submits that claim 12 and claims 13-14, 17-19 and 21, which depend therefrom, are allowable over the cited references.


The rejection of claims 1, 4, 5, 7-8, 10 under 35 U.S.C. § 102(b) as being anticipated by Redden et al. (U.S. Patent No. 6,345,720) is respectfully traversed and reconsideration is requested. As a preliminary matter, Applicant notes that since Redden et al. is issued on February 12, 2002, this rejection was meant to be under 35 U.S.C. § 102(e). Applicant respectfully submits that Redden et al. is not available as prior art against the present application under 35 U.S.C. § 102(e). That is, the present application claims priority to Korean Patent Application No. 2000-7384, filed on February 16, 2000. Redden et al. bears a filing date of December 11, 2000, which is after the claimed priority date of the present application, and is therefore not available as prior art against the present application. Therefore, Applicant respectfully requests that the rejection of the claims over Redden et al. be withdrawn. Applicants herewith submit a certified translation of the Korean Patent Application upon which the priority claim is based to perfect the claim of priority.

Applicant believes the foregoing amendments place the application in condition for allowance and early, favorable action is respectfully solicited. If the Examiner deems that a telephone conference would further the prosecution of this application, the Examiner is invited to call the undersigned attorney at the telephone number (202): 496 - 7500. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911.

Dated: June 17, 2004

Respectfully submitted,

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VERIFICATION OF TRANSLATION

I, Kwang-Won Lee of 114-dong 1103-ho, Hwanggoljugong APT., Yeongtong-dong, Paldal-gu, Suwon-si, Gyeonggi-do, Republic of Korea, declare that I have a thorough knowledge of the Korean and English languages, and the writings contained in the following pages are correct English translation of the specification and claims of Korean Patent Application No. 2000-7384.

This 17th day of June, 2004

By:

Kwang-Won Lee

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KOREAN INDUSTRIAL PROPERTY OFFICE

This is to certify that the following application annexed hereto
is a true copy from the records of the Korean Industrial Property Office

Application Number : 2000 year Patent Application 7384, 10-2000-0007384

Date of Application : February 16, 2000

Applicant(s) : LG. Philips LCD Co., Ltd.

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COMMISSIONER

[BIBLIOGRAPHICAL DOCUMENTS]

[TITLE OF DOCUMENT] PATENT APPLICATION

[CLASSIFICATION] PATENT

[RECIPIENT] COMMISSIONER

[REFERENCE NO.] 0001

[SUBMISSION DATE] 02. 16. 2000

[TITLE OF INVENTION IN KOREAN] 액정표시장치모듈의 포장컨테이너

[TITLE OF INVENTION IN ENGLISH] Packing Container for Liquid Crystal Display
Device Module

[APPLICANT]

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[NAME IN ENGLISH] LG. Philips LCD Co., Ltd.

[APPLICANT CORD] 1-1998-101865-5

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[ATTORNEY CORD] 9-1998-000534-2

[ALL-INCLUSIVE AUTHORIZATION REGISTRATION NO.] 1999-001832-7

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[ZIP CODE] 730-040

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[PURPORT] We submit application as above under the article 42 of the Patent Act and
request of examination as above under the article 60 of the Patent Act.

Attorney

Jung, Won-Ki (seal)

[FEES]

| | | |
|------------------------------|----------|------------|
| [BASIC APPLICATION FEE] | 13 pages | 29,000 Won |
| [ADDITIONAL APPLICATION FEE] | pages | 0 Won |
| [PRIORITY FEE] | 0 things | 0 Won |
| [EXAMINATION REQUEST FEE] | 0 claims | 0 Won |
| [TOTAL] | | 29,000 Won |

[ENCLOSED] 1. Abstract, Specifications (with Drawings)_1 set

[DOCUMENT OF ABSTRACT]

[ABSTRACT]

A liquid crystal display module packing container includes a rectangular lower plate, first and second side walls extending from sides of the lower plate, an upper plate extending from an upper edge of the first side wall, a plurality of auxiliary side walls extending from the ends and the middle of the first and second side walls, a plurality of fixing jaws located on inner surfaces of the packing container, and a plurality of grooves located at side edges of the upper plate and at upper edges of the first and second side walls.

[REPRESENTATIVE FIGURE]

FIG. 3

[SPECIFICATIONS]

[NAME OF INVENTION]

Packing container for liquid crystal display device module

[BRIEF EXPLANATION OF FIGURES]

FIG. 1 is a perspective view showing a liquid crystal display device module according to a related art;

FIG. 2 is a perspective view showing a prior art packing container for liquid crystal display device modules;

FIG. 3 is a perspective view showing a packing container for liquid crystal display device modules according to the principles of the present invention; and

FIG. 4 is a diagram showing a side view of the packing container of FIG. 3 when it is unfolded.

< Explanation of major parts in the FIG.s >

| | |
|------------------------|----------------------------|
| 10: packing unit | 101: liquid crystal module |
| 300: packing container | 310: lower plate |
| 320a, 320b: side walls | 330: upper plate |
| 326: grooves | 6: lamp wire |

[DETAILED DESCRIPTION OF INVENTION]

[OBJECT OF INVENTION]

[TECHNICAL FIELD OF THE INVENTION AND PRIOR ART OF THE FIELD]

The present invention relates to an apparatus for packing liquid crystal display device, and more particularly to a packing container for liquid crystal display modules which simplifies the process of packaging liquid crystal display modules and is easily incorporated into an automated assembly line for manufacturing and packaging liquid crystal display modules.

In a process of packaging liquid crystal display device modules (LCMs) just manufactured, it is very important to protect each liquid crystal display module from damage which may occur during various operations, such as loading, charging, transport, cargo packing, shipping and the like.

FIG. 1 is a perspective view showing a liquid crystal display device module (LCM) according to a related art. As shown in FIG. 1, a related art LCM 100 has first and second frames 2 and 4 with liquid crystal panel (not shown) and back-light device (not shown) interposed therebetween. The backlight device has lamp (not shown) and lamp housing (not shown) with a lamp wire 6 exposed to connect with an exterior power source. The lamp wire 6 may locate in various directions according to models. At this point, the liquid crystal panel (not shown) in the LCM 100 has a plurality of switching devices and driving circuits to drive the switching devices. Since the switching devices and driving circuits are easily affected by static electricity or exterior impact, a typical packing container for the LCM is developed to safely pack the LCMs.

FIG. 2 is a perspective view illustrating a related art packing container 200 for packing the typical LCMs 100. A packing unit 10 shelters the LCM, and a packing container 200 accommodates the packing unit 10. Namely, each LCM 100 is placed into the packing unit

10 before being put into the packing container 200 in order to protect the LCM 100 from the static electricity and exterior impact. The packing unit 10 is an anti-electrostatic bag that is made of polypropylene (PP), polyethylene (PE) or the like, and includes metallic material to exclude an affect from the static electricity. Furthermore, the related art packing container 200 for the LCMs 100 is produced preferably by a metal mold and made from resins such as expanded poly ethylene (EPE), expanded poly propylene (EPP) or the like.

In FIG. 2, the related art packing container 200 includes a lower plate 210, side walls 220a and 220b and upper covers 230a and 230b. In general, the packing container 220 can accommodate ten pieces of LCMs 100. The lower plate 210 has different thickness in between center portion and peripheral portions for the purpose of increasing impact endurance, but substantially has planar surfaces. Fixing jaws 222 are disposed on the inner surface of the side walls 220a and 220d to individually receive and hold the packing unit 10 including the LCMs 100. Since the side walls 220a and 220b have the fixing jaws 222, they do not get bent or are not twisted. The upper covers 230a and 230b are extended from upper ends of the side walls 220a and 220b, respectively. The packing container 200 of the related art also substantially includes two upper covers 230a and 230b that can be folded over and down towards the lower plate 210 after the LCMs 100 have been inserted into the packing container 200 along through the fixing jaws 222.

Meanwhile, the LCM 100 includes glass or quartz substrates so that a little scratches or flaws on those substrates may cause serious problems in display images. Therefore, it is main issues that the packing container 200 does not make any scratches on the LCMs 100. At this point, the related art packing container 200 has some disadvantages. In the related art, since the fixing jaws 222 guide and hold only two sides of each LCM 100, some scratches or flaws may occur on the surfaces of the LCMs 100 when the LCMs 100 are inserted into the

packing container 200. Furthermore, if a packing container 200 holding LCMs 100 is dropped, or if the LCMs 100 are stored for a long time, the LCMs 100 tend to become bent.

Further, when the upper covers 230a and 230b are closed, they forcefully contact the packing unit 10 containing the LCM 100 such that pressure is applied to the lamp wire (reference 6 of FIG. 1) of the LCM 100. Therefore, if the LCMs are stored in the packing container 200 for a long time, the lamp wire 6 may be damaged by the pressure applied by the upper covers 230a and 230b of the packing container 200.

In addition, during packing or unpacking work, because both of the two upper covers 230a and 230b must be closed or opened, work efficiency is poor.

[TECHNICAL SUBJECT OF INVENTION]

To overcome the problems described above, the present invention is directed to a packing container for liquid crystal display modules, which substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

An object of the present invention is to provide a packing container that minimizes a bending error of LCMs in dropping or storing. Another object of the present invention is to provide a packing container that excludes a breaking error of a lamp wire of the LCMs in dropping or storing. Another object of the present invention is to provide a packing container that improves the efficiency of packing or unpacking work.

[CONSTRUCTION AND OPERATION OF INVENTION]

In order to achieve the above object, the preferred embodiment of the present invention provides a liquid crystal display module packing container, which includes: a lower plate having a rectangular shape; first and second side walls each extending from a respective

side edge of the lower plate, each of the first and second side walls having a plurality of first fixing jaws; and an upper plate extending from an upper edge of the first side wall.

The packing container further includes a plurality of projections provided on outer surfaces of the packing container device to relieve an impact from an exterior of the apparatus. Each projection has an alternately stepped shape forming a sequence of concave and convex structures to relieve exterior impacts applied to the packing container device.

The lower plate includes a plurality of second fixing jaws disposed on an inner surface thereof to receive and retain liquid crystal display modules. And the upper plate includes a plurality of third fixing jaws on an inner surface thereof, and wherein each of the third fixing jaws corresponds to each second fixing jaws to hold the liquid crystal display module.

The packing container further includes a plurality of grooves at the upper edges of the first and second side walls and at each side edge of the upper plate, wherein the grooves receiving lamp wires of liquid crystal display modules.

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

FIG. 3 is a perspective view of a packing container according to the preferred embodiment of the present invention. A liquid crystal display module (LCM) 100 is placed into a packing unit 10 before being put into a packing container 300 of the preferred embodiment. In order to protect the LCM 100 from static electricity and exterior impact, the packing unit 10 is an anto-electrostatic bag that is preferably made of polypropylene (PP), polyethylene (PE) or the like, and includes metallic material to exclude an affect from the static electricity. Furthermore, the packing container 300 of the present invention is produced preferably by a metal mold and made from resins such as expanded poly ethylene (EPE), expanded poly propylene (EPP) or the like.

The inventive packing container 300 includes lower plate 310, first and second side walls 320a and 320b, and an upper plate 330. In the present invention, the packing container 300 usually accommodates more than 10 pieces of LCMs 100. The lower plate 310 preferably includes a plurality of first fixing jaws 312 at a central area thereof. First and second side walls 320a and 320b extend from each side edge of the lower plate 310, and the first and second side walls 320a and 320b are integrally connected to the lower plate 310. Just one of the side walls 320a and 320b, for example, the first side wall 320a includes the upper plate or cover 330 arranged integrally with and extend from the upper end of the first side wall 320a. The upper plate or cover 330 can be folded over and down towards the lower plate 310 after the LCMs 100 have been inserted into the packing container 300. A plurality of projections 324 are preferably provided on the outer surface of the packing container 300 for absorbing impact applied to the container from the outside.

Each of the first and second side walls 320a and 320b includes first and second auxiliary side walls at both ends thereof, and preferably includes a third auxiliary side wall at a middle area thereof. The auxiliary side walls prevent a deformation (such as twist or bent) of the side walls 320a and 320b, when a normal impact is applied to the larger surface of the side walls 320a or 320b.

The first fixing jaws 312 of the lower plate 310 individually receive and hold the LCMs 100 therebetween. And second fixing jaws 322 similar to the first fixing jaws 312 are disposed on the inner surface of the first and second side walls 320a and 320b to individually receive and hold the LCMs 100 therebetween. In addition, third fixing jaws 332 are disposed on the inner surface of the upper plate 330 to individually receive and hold the LCMs 100 therebetween. Therefore, when the LCM 100 is placed into the packing container 300 and when the upper plate 330 is closed, the LCM 100 is held by corresponding first,

second, and third fixing jaws 312, 322, and 332. The lower plate 310, first and second side walls 320a and 320b, and the upper plate 330 protect the held LCM 100.

The inventive packing container 300 preferably has slant surfaces at the edges or joints portions of four plates so that it can be easily folded. In other words, each of the edge portions or interconnected joints of the packing container 300 has a longitudinal section in the shape of "V", and the first and second side walls 320a and 320b are foldably connected to the lower plate 310 and the upper plate 340 is foldably connected to the first side wall 320a. Thus, the apparatus can easily be transformed from the unfolded flat state of FIG. 4 to the folded state shown in FIG. 3. Further, in the upper plate or cover 330 of the packing container 300, the width of the cover 330 preferably has a dimension less than or equal to the width of the packing container 300.

In addition, grooves 326 are formed at each side edge portion of the upper plate 330 and at each upper edge portion of the first and second side walls 320a and 320b. The grooves 326 are designed to receive a lamp wire 6 of the LCM 100, when the LCM 100 is placed into the packing container 300. Namely, the grooves 330 prevent forceful contact between the upper plate 330 and the lamp wires 6.

The projections 324, which are preferably formed by two protruding members on each outer surface of the packing container 300, serve to relieve and absorb the exterior impact applied to the packing container 300. The projections 324 are disposed along the transversal direction in such a manner that they are spaced apart from each other. Each projection 324 preferably has an alternately stepped shape including a sequence of concaves and convexes.

The first, second, and third fixing jaws 312, 322, and 332 are disposed on each inner surface of the lower substrate 310, the first and second side walls 320a and 320b, and the upper substrate 330 of the packing container 300 in such a manner that they are spaced by a

predetermined distance therebetween. The first, second, and third fixing jaws 312, 322, and 332 are aligned with fixing jaws on the other inner surfaces. The number of LCMs 100 able to be accommodated in the packing apparatus 300 and the corresponding number of fixing jaws 312, 322, and 332 can be varied as needed.

FIG. 4 is a diagram showing a side view of the packing container of FIG. 3 when it is unfolded. Also FIG. 4 of an unfolded diagram illustrates the packing container of FIG. 3 when it is viewed in a side "A". As shown, the upper plate 330, the first side wall 320a, the lower substrate 310, and the second side wall 320b are sequentially connected. Further, each connected edge portion of them has the "V" shape, which enables efficient folding of the packing container 300. The projections 324 are disposed on the outer surface of the plates and side walls to absorb an exterior impact.

[EFFECT OF INVENTION]

The inventive packing container accommodating the LCMs has the following advantages.

First, since the lower plate even has the plurality of fixing jaws, the LCMs can be tightly hold and protected from the outer impact even if the packing container having the LCMs are carried and transformed.

Second, since the packing container of the present invention has the plurality of projections on the outer surfaces thereof, the exterior impacts applied to the packing apparatus can be relieved and absorbed, thereby efficiently protecting the LCMs therein.

Third, the grooves are formed are formed at each side edge of the upper plate and at the upper edges of the first and second side walls. Therefore, the lamp wires of the LCMs are not damages by the upper plate.

[RANGE OF CLAIMS]

[CLAIM 1]

A liquid crystal display module packing container device comprising:
a lower plate having a rectangular shape;
first and second side walls each extending from a respective side edge of the lower plate, each of the first and second side walls having a plurality of first fixing jaws; and
an upper plate extending from an upper edge of the first side wall.

[CLAIM 2]

The device of claim 1, further comprising a plurality of projections provided on outer surfaces of the packing container device to relieve an impact from an exterior of the apparatus.

[CLAIM 3]

The device of claim 2, wherein each projection has an alternately stepped shape forming a sequence of concave and convex structures to relieve exterior impacts applied to the packing container device.

[CLAIM 4]

The device of claim 1, wherein the lower plate includes a plurality of second fixing jaws disposed on an inner surface thereof to receive and retain liquid crystal display modules.

[CLAIM 5]

The device of claim 4, wherein the upper plate includes a plurality of third fixing jaws on an inner surface thereof, and wherein each of the third fixing jaws corresponds to each second fixing jaws to hold the liquid crystal display module.

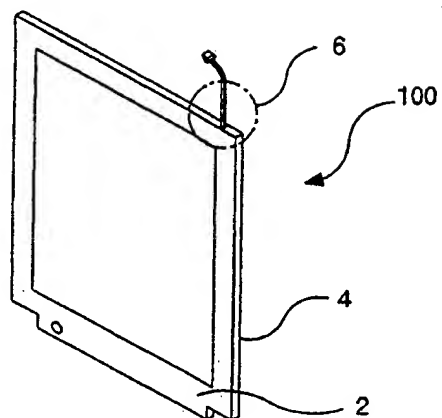
[CLAIM 6]

The device of claim 1, further comprising a plurality of grooves at the upper edges of the first and second side walls and at each side edge of the upper plate, wherein the grooves receiving lamp wires of liquid crystal display modules.

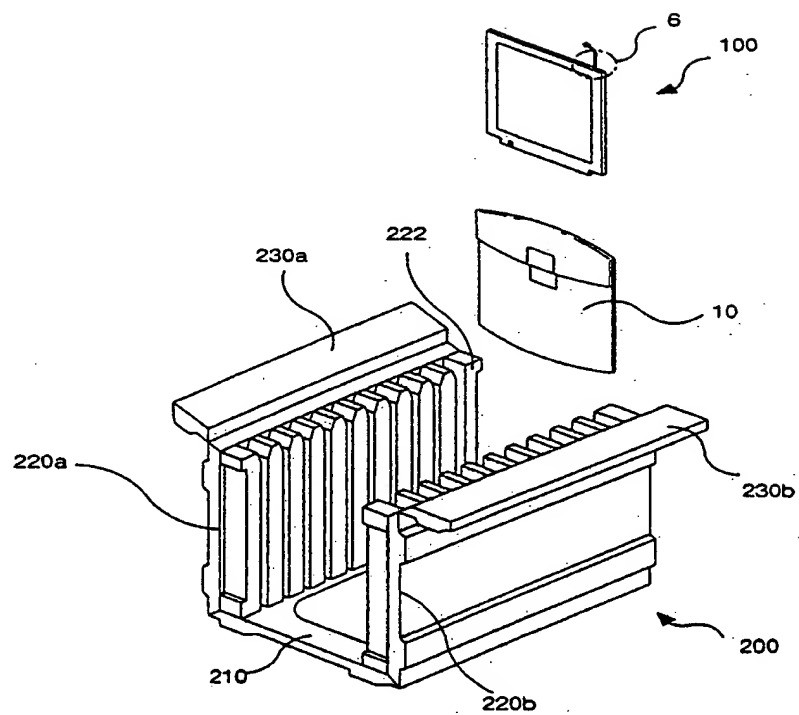


[DRAWINGS]

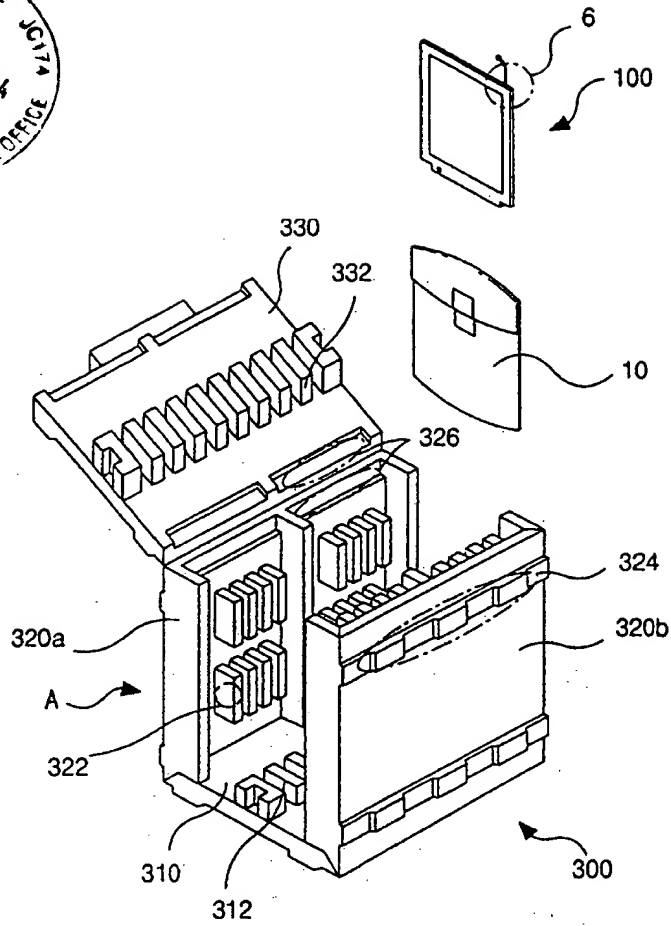
[Fig. 1]



[Fig. 2]



[Fig. 3]



[Fig. 4]

